Public Document No. 125

The Commonwealth of Massachusetts

ANNUAL REPORT

OF

THE TRUSTEES

OF THE

BRADFORD DURFEE TEXTILE SCHOOL

OF

FALL RIVER

FOR THE

YEAR ENDING NOVEMBER 30, 1920

DEPARTMENT OF EDUCATION

BOSTON
WRIGHT & POTTER PRINTING CO., STATE PRINTERS
32 DERNE STREET

Miscellaneous
printed matter

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The Commonwealth of Massachusetts

Department of Education, Boston, Feb. 4, 1921.

To the Honorable Senate and House of Representatives.

Gentlemen: — In accordance with the provisions of section 32 of chapter 30 of the General Laws, I transmit to you herewith, for the use of the General Court, the annual report of the Bradford Durfee Textile School for the year ending June 30, 1920.

Respectfully yours,

PAYSON SMITH,
Commissioner of Education.

The Commonwealth of Massachusetts

DEPARTMENT OF EDUCATION.

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Massachusetts Agricultural College.
Massachusetts Nautical School.
Bradford Durfee Textile School.
Lowell Textile School.
New Bedford Textile School.

BRADFORD DURFEE TEXTILE SCHOOL.

July 1, 1919, to June 30, 1920.

Officers.

LEONTINE LINCOLN, ... *President.*
JOHN S. BRAYTON, }
PETER H. CORR, } . . . . . *Vice-Presidents.*
WILLIAM HOPEWELL, ... *Clerk.*
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Trustees.

Term expires June 30, 1920.

CHARLES B. CHASE. ROBERT PLACE.
ARTHUR S. PHILLIPS. BENJAMIN B. READ.
JAMES TANSEY.

Term expires June 30, 1921.

JOHN S. BRAYTON. WILLIAM HOPEWELL.
FRANK L. CARPENTER. LEONTINE LINCOLN.
JAMES SINCLAIR.

Term expires June 30, 1922.

THOMAS B. BASSETT. EDMOND COTE.
PETER H. CORR. JOHN GOSS.
RICHARD G. RILEY.

Ex Officio.

DR. PAYSON SMITH, ... *Commissioner of Education.*
HON. JAMES H. KAY, ... *Mayor.*
HECTOR L. BELISLE, ... *Superintendent of Schools.*

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Finance Committee.

PETER H. CORR. ARTHUR S. PHILLIPS.
JAMES TANSEY.

REPORT OF THE TRUSTEES

OF

THE BRADFORD DURFEE TEXTILE SCHOOL.

INCORPORATED, 1899. TRANSFERRED TO THE STATE JULY 1, 1918.

To the Commissioner of Education.

The Trustees of The Bradford Durfee Textile School of Fall River have the honor to respectfully submit the following report for the school year extending from July 1, 1919, to June 30, 1920.

LOCATION.

The location of the school is near the center of the city of Fall River, bounded on the north by Elm Street, on the east by Durfee Street, on the south by Bank Street, on the west by Green Street, and is on an elevation overlooking Taunton River, where it empties into Mount Hope Bay.

BUILDINGS.

The main building fronts on Durfee Street, corner of Bank Street. It is of modified colonial style of architecture and consists of three stories and basement. The first story is of six-cut Fall River granite laid in courses; the two upper stories are of gray mottled pressed brick with trimmings of Fall River granite; the main cornice is of copper. The basement is constructed of quarry-faced Fall River granite laid in coursed ashlar.

The first floor is occupied by the general office, trustees' room, exhibition room, cotton carding and spinning machinery room, classroom, supply storeroom, and men's lavatory and toilet room.

The second floor contains a classroom for the weaving department, a classroom for instruction in mill calculations, a room for demonstration work on combing machinery, the designing department, the freehand drawing department, the assembly hall, a room in which Americanization work is carried on by the city school department, and a women's toilet.

The third floor is occupied by elementary and advanced chemical laboratories and a classroom for the chemistry department, while the engineering department also has on this floor steam and electrical lecture rooms, two mechanical drawing rooms, storerooms, blue-print room and photographic dark room.

In the basement of this building are located the machine shop, experimental steam engineering room, electrical laboratory and classroom, general storerooms, opener room and students' locker room.

The four-story addition, built on Elm Street, is of modern mill construction, 66 by 70 feet, devoted entirely to warp preparation, power and hand weaving and cloth room machinery.

On the first floor are located the plain looms for instruction in plain loom fixing and weaving; on the second floor are the fancy looms consisting of box and dobby, leno, lappet and Jacquard looms, also working models of the various types of loom heads.

The third floor is occupied by the warp preparation department: spooling, winding, doubling, warping and slashing; web drawing both by hand and by power.

On the fourth floor are placed the hand looms, card-cutting machines and finishing machinery.

The dyehouse, situated on Green Street, in the rear of the main building, is 52 by 24 feet.

The west and north walls, which are permanent, are of cut stone and coursed ashlar; the south and east temporary walls are of brick and concrete. This building has a saw-tooth roof, high and with good ventilation, is designed after the style of the main administration building, and is specially constructed for a dye and bleach house.

Power House.

The power plant addition consists of an engine and dynamo room 26 by 40 feet, a boiler house 56 by 40 feet, and a pump room 15 by 25 feet.

The structure is built in a thoroughly fireproof manner. The walls are of faced brick, set in stained mortar, with paneled corner pieces and an ornamental cornice capped with copper. Large windows admit light to three sides of the building, and a roof monitor gives overhead light and ventilation. The roof of the boiler and engine house is of reinforced concrete supported by heavy steel beams.

The floor of the boiler house is concrete with iron plates in front of the boilers, while that of the engine room is fine concrete with terrazzo top supported with steel beams. The engine room walls are furred with gypsum tiling blocks, with wainscotting of enameled tile.

The boiler room is planned to accommodate three boilers, two of which are in place. Power is generated by a 150 horsepower direct connected set, and is transmitted to individual motors in the machinery rooms.

This power plant with its equipment is a model of its kind, and is so arranged that the various problems of determining operating costs are worked out by means of special tests and daily records.

All the buildings are adapted to the manufacture of textile fabrics and to educational purposes, with all the modern appliances as to heat, ventilation, electric lighting and sanitary arrangements.

Between the power house and the annex is a large lavatory fitted with the latest sanitary devices, — bowls, drinking fountains and liquid-soap receptacles.

Floor space is divided as follows: —

	Square Feet.
Administration,	2,234
Picking, carding and spinning,	8,092
Weaving,	9,495
Designing,	6,187
Freehand drawing,	1,000
Mathematics,	650
Assembly hall,	2,789

	Square Feet.
Power, heat and light,	3,875
Engineering and electricity,	9,202
Chemistry and dyeing,	5,611
Toilets and lockers,	2,394
Janitor's storage,	1,120
Corridors,	6,568
Total,	59,217

Equipment.

The school is well equipped with the most modern machinery and appliances especially adapted for giving thorough instruction in the manufacture of cotton goods from the raw material to the finished fabric.

Carding and Spinning Department.

One complete set of picking machinery from Saco & Pettee Machine Shops, consisting of —

One opener with automatic feeder connected by inclined cleaning trunk to one single beater breaker picker with condenser and gauge box feeder.

One single beater finisher picker.

One 40-inch revolving flat card from Saco-Lowell Machine Shops.

One 40-inch revolving flat card from Mason Machine Works.

One 40-inch revolving flat card from Howard & Bullough American Machine Company.

One 40-inch revolving flat card from Whitin Machine Works.

One railway head with evener motion and metallic rolls from Saco & Pettee Machine Shops.

One drawing frame with leather and metallic rolls from Mason Machine Works.

One sliver lap machine from Mason Machine Works.

One sliver lap machine from Whitin Machine Works.

One ribbon lap machine from Whitin Machine Works.

One 6-head comber from Whitin Machine Works.

One 8-head comber from Whitin Machine Works.

One 6-head comber from Mason Machine Works.

One 2-head Nasmith comber from John Hetherington & Sons, Ltd.

One 12 by 6 slubber with metallic rolls, 48 spindles, from Saco & Pettee Machine Shops.

One drawing frame, 2 deliveries, mechanical stop motion, from John Hetherington & Sons, Ltd.

One 10 by 5 intermediate, 64 spindles, from Saco & Pettee Machine Shops.

One drawing frame, 2 deliveries, electrical stop motion, from John Hetherington & Sons, Ltd.

One drawing frame with metallic rolls from Saco & Pettee Machine Shops.

One 7 by 3½ roving frame, 80 spindles, from Saco & Pettee Machine Shops.

One 6 by 2½ jack frame, 96 spindles, from Saco & Pettee Machine Shops.

One 6 by 2½ jack frame, 72 spindles, from John Hetherington & Sons, Ltd.

One 6 by 2½ jack frame, 96 spindles, from Woonsocket Machine & Press Company.

One combination warp and filling spinning frame, 80 spindles, from Mason Machine Works.

One combination warp and filling spinning frame, 64 spindles, from Whitin Machine Works.

One combination warp and filling spinning frame, 208 spindles, from Saco & Pettee Machine Shops.
One combination warp and filling spinning frame, 192 spindles, from Fales & Jencks Spinning Company.
One combination warp and filling spinning frame, 192 spindles, from Howard & Bullough American Machine Company.
One spinning mule, 192 spindles, from Mason Machine Works.
One wet and dry twister, 68 spindles, from Fales & Jencks Machine Company.
One wet and dry twister, 60 spindles, from Draper Company.
Six Novelty yarn arrangements from Draper Company.
One yarn gassing machine from Woonsocket Machine and Press Company.
One braiding machine for round braid, 16 strands, from New England Butt Company.
One braiding machine for flat braid, 25 strands, from New England Butt Company.
One Weeks banding machine from Draper Company.
Necessary machines for sizing and testing yarns.

Also the following models for instruction purposes: —

One model fly frame builder motion from Saco & Pettee Machine Shops.
One model fly frame builder motion from Howard & Bullough American Machine Company.
One model Nasmith comber head from John Hetherington & Sons, Ltd.
One model spinning frame builder motion from Howard & Bullough American Machine Company.
One model card bend from Howard & Bullough American Machine Company.
One model set of metallic drawing rolls from Metallic Drawing Roll Company.
One tachometer from George Thomas & Co.
One Moscrop individual yarn tester from Draper Company.
One model differential motion from Howard & Bullough American Machine Company.
One model differential motion from Saco & Pettee Machine Shops.
One model differential motion from Providence Machine Works.
One model differential motion from Woonsocket Machine and Press Company.
One model differential motion from Dobson & Barlow Company.
One yarn tester from Standard Mills Supply Company.
One yarn and roving twist tester from Standard Mills Supply Company.
One power yarn tester from Henry L. Scott & Co.

Designing Department.

The designing department is provided with a large room fitted with desks specially designed for work in cloth designing and analysis. Suitable equipment for blackboard work is also provided. Instruments for testing yarns for counts, twist and breaking strength, also for testing cloth for stretch and breaking strength, are on hand for the use of the students.

A large storeroom, situated next to the designing room, contains a wide range of cloth samples for analysis purposes, and is also used for filing the instruction papers used in this department.

Freehand Drawing Department.

The room devoted to this department is equipped with desks, drawing benches, drawing tables and drawing boards to accommodate 32 students. The department is also well supplied with plaster casts and models for the use of the students, charts illustrating color problems, frames for drawings, and apparatus for painting purposes.

Warp Preparation Department.

One bobbin spooler, 42 spindles, from Draper Company.
One bobbin spooler, 40 spindles, from Saco & Pettee Machine Shops.
One bobbin spooler, 24 spindles, from Easton & Burnham Machine Company.
One skein spooler, 24 spindles, from Easton & Burnham Machine Company.
Six Bishop tension devices for spooling filling wind from Lyons Manufacturing Company.
One reel, 50 spindles, from Whitin Machine Works.
Six knotters from Barber & Colman.
One cone winder from Universal Winding Machine Company.
One doubler and winder, 10 spindles, from Easton & Burnham Machine Company.
One filling bobbin winder, 30 spindles, from Jacob K. Altemus.
One beam warper from Draper Company.
One ball warper from T. C. Entwistle Company.
One slasher from Lowell Machine Shops.
One Morrill slasher comb from Draper Company.
One size kettle from Lowell Machine Shops.
One short chain beamer from Cole Brothers.
One long chain beamer from T. C. Entwistle Company.
One harness finding machine from Cyrus E. Smith.
Drawing-in frames.
One narrow fabric beaming machine.

Weaving Department.

One plain loom from the Mason Machine Works.
One plain loom with electric stop motion from Crompton & Knowles Loom Works.
One plain loom from Stafford Company.
Twenty-one plain looms from Kilburn, Lincoln Machine Company.
Two plain looms, arranged for 2, 3, 4 and 5 harness work, from Kilburn, Lincoln Machine Company.
One plain loom, arranged for 2, 3 and 4 harness work, from Whitin Machine works.
Four Draper magazine print cloth looms from Draper Company.
Two Draper sateen looms, arranged for 2, 3, 4 and 5 harness work, from Draper Company.
One automatic plain loom from Stafford Company.
One tubing loom from Lewiston Machine Company.
One light duck loom from Crompton & Knowles Loom Works.
One gingham loom, 6 by 1 boxes, with metallic stop motion, from Crompton & Knowles Loom Works.
Three gingham looms, 4 by 1 boxes, from Crompton & Knowles Loom Works.
One Draper magazine loom, 16-harness dobby, from Draper Company.
One fancy cotton loom, 20-harness dobby, from Kilburn, Lincoln Machine Company.

One fancy cotton loom, 25-harness dobby, from Kilburn, Lincoln Machine Company.
One fancy cotton loom, 25-harness dobby, from Mason Machine Works.
One fancy cotton loom, 25-harness dobby, from Stafford Company.
One fancy cotton loom, 20-harness dobby, from Whitin Machine Works.
One Ideal automatic loom, 20-harness dobby, from Stafford Company.
One Ideal automatic plain loom from Stafford Company.
Four 30-inch print cloth looms, Ideal, from Stafford Company.
One two-frame lappet loom from Crompton & Knowles Loom Works.
One velvet loom, side cams, positive lift, 8-harness and extra cams.
One fancy cotton loom, 16-harness dobby, with reed and attachment for weaving "Ondule" cloth, from Crompton & Knowles Loom Works.
One fancy cotton loom, 20-harness dobby, 4 by 1 boxes, from Crompton & Knowles Loom Works.
One fancy cotton loom, 25-harness dobby, 4 by 1 boxes, from Crompton & Thayer Loom Company.
One Knowles Gem loom, 20-harness dobby, 4 by 4 boxes, with double multiplier, from Crompton & Knowles Loom Works.
One fancy towel loom, 12-harness dobby, 3 by 1 boxes, from Crompton & Knowles Loom Works.
One Crompton & Knowles cotton loom with 400-hook double-lift single cylinder Jacquard machine.
One Crompton & Knowles cotton loom with 400-hook single-lift single cylinder Jacquard machine.
One Crompton & Knowles damask loom, 4 by 1 boxes, with 600-hook double-lift single cylinder Halton Jacquard machine.
One Crompton & Knowles Terry towel loom, 2 by 1 boxes, with 600-hook rise and fall Jacquard machine.
One Kilburn, Lincoln Machine Company, cotton loom with 600-hook double-lift double cylinder Halton Jacquard machine.
One Kilburn & Lincoln narrow fabric loom, 16-harness dobby.
One Crompton & Knowles narrow fabric loom with 200-hook double-lift single cylinder Jacquard machine.
One Marseilles quilt loom, 2 by 2 box, 1248-hook double-lift double cylinder Jacquard, from Crompton & Knowles Loom Works.
One silk loom, with 600-rise and fall Jacquard single cylinder, from Crompton & Knowles Loom Works.
One quiller and drum for the narrow fabric loom from Crompton & Knowles Loom Works.
One Halton 600-rise and fall Jacquard Machine.
One power piano card cutter from John Royle & Sons.
One foot power piano card cutter from John Royle & Sons.
Two card lacing frames.

Also the following parts of looms which are used for experimental work: —

One 12-harness dobby head from Whitin Machine Works.
One 12-harness dobby head from Stafford Company.
One 16-harness dobby head from Mason Machine Works.
Twenty-six hand looms, 30-harness, 4 by 4 boxes.
Two hand looms, 200-hook Jacquard, 4 by 4 boxes.
One 8-harness double-lift dobby, arranged as a working leno model with yokes, jumper and slackener.
Two 12-harness dobby heads from Crompton & Knowles Loom Works.
One 8-harness dobby head from Crompton & Knowles Loom Works.

One 16-harness dobby head from Crompton & Knowles Loom Works.
One 12-harness dobby head from Crompton & Thayer Loom Company.
One model dobby head motion, 16-harness, single index, mounted on stand, from Stafford Company.
One 20-harness Gem dobby head from Crompton & Knowles Loom Works.
One 20-harness Gem dobby head with two-weave motion from Crompton & Knowles Loom Works.
Three 6 by 1 box motions from Crompton & Knowles Loom Works.
One 4 by 1 box motion from Crompton & Knowles Loom Works.
Two 200 single-lift single cylinder Jacquards from Thomas Halton's Sons.
Four 200 single-lift single cylinder Jacquards from Crompton & Knowles Loom Works.
Machines for testing and sizing cloth.
One American warp-drawing machine from the American Warp-Drawing Machine Company.
One model dobby head motion, 16-harness, double index, mounted on stand, from Stafford Company.

Cloth Room.

One inspecting and brushing machine from Curtis & Marble Machine Company.
One railway sewing and rolling machine from Curtis & Marble Machine Company.
One combined shearing and brushing machine from Curtis & Marble Machine Company.
One float thread shearing machine from Curtis & Marble Machine Company.
One cloth folder from Curtis & Marble Machine Company.
One double action napper from Woonsocket Napping Machinery Company.

Chemistry and Dyeing Department.

This department is equipped with all the appointments necessary for thorough instruction in the various courses offered.

The general experimental laboratory is provided with desks and lockers for 140 students. Each desk is connected with gas, water and sink, and is furnished with common reagents. Large supplies of reagents and a number of balances for general use are conveniently located near at hand. Commodious hoods with forced draught assure the best of ventilation.

The advanced laboratory is equipped for 31 students. Especially roomy lockers are provided, and, in addition to the usual conveniences, special aids for advanced work are provided.

The department library and reference room contains a good collection of texts on chemistry and dyeing subjects, and is open to students selecting the chemistry course. The balances and other precision instruments are installed in this room.

The stock rooms carry supplies of chemical apparatus and instruments from which the student is supplied according to the requirements of his course.

The dyehouse is a building specially designed for the purpose, and contains the necessary machinery and apparatus for the bleaching and dyeing of raw stock and yarns in a practical manner.

Dyeing Laboratory.

The dyeing equipment is as follows: —

Three skein-dyeing tubs from Benj. T. Smith Company.
One hydro-extractor from American Tool and Machine Company.
One Hussong dyeing machine from the Hussong Dyeing Machine Company.
One indigo dyeing machine from Textile Finishing Machinery Company.
One pressure kier from Textile Finishing Machinery Company.
Two chain dyeing machines from Textile Finishing Machinery Company.
One chain sizing machine from Textile Finishing Machinery Company.
One chain drying machine from Textile Finishing Machinery Company.
One bleaching kier from Patten Brothers.
Twelve experimental dyeing apparatus for 7 cups each.
One experimental skein drier.
One high-pressure steam chest from William Allen Sons Company.
One winding-on machine from Draper Company.
One winding-off machine from Draper Company.
One centrifugal pump from F. B. Hayes Machinery Company.

Engineering Department.

Mechanical Drawing Room.

Thirty-two drawing benches.
Two Universal drawing benches.
Six plain benches.
One hundred and twenty-seven drawing boards.
Two cases for boards and instruments.
Two sectional cases for drawings.
One catalogue filing case.
Bookcase of four sections with reference library.
One four-arc lamp blue-printing machine.
One architect's transit, tripod and tape.
One architect's level.

Machine Shop.

One 15-inch by 8-foot Sebastian engine lathe.
Five 16-inch by 6-foot Reed engine lathes with compound rests.
One 12-inch by 6-foot Prentice head lathe.
Two 12-inch by 6-foot Reed Prentice engine lathes.
Six 12-inch by 5-foot Reed engine lathes with plain rests.
One 16-inch by 8-foot Whitcomb-Blaisdell engine lathe.
One 13-inch by 6-foot Whitcomb-Blaisdell engine lathe.
One 14-inch by 6-foot Flather engine lathe with draw-in collets.
Three 11-inch by 4-foot Reed speed lathes.
One 11-inch by 4-foot Blount speed lathe.
One 11-inch by 4-foot Reed wood-turning lathe.
One 10-inch by 30-inch Landis Universal grinding machine.
One Brown & Sharpe No. 1½ milling machine.
One Kempsmith Universal milling machine.
One plain gear cutter from Whitin Machine Company.

One 15-inch Smith & Miller Universal shaper with swivel table.
One 24-inch by 24-inch by 6-foot Whitcomb planer.
One 20-inch Prentice Brothers stationary head drill.
One 25-inch Snider upright drill.
One 13-inch slate sensitive drill, two spindles.
One Brown & Sharpe No. 4 screw machine.
One 13-inch Washburn Machine Company sensitive drill.
One Heald Machine Company twist drill grinder, capacity $\frac{1}{8}$-inch to $2\frac{1}{4}$-inch, with thinning attachment.
One Blount 12-inch by 2-foot double dry grinder.
One $2\frac{1}{2}$-inch by 17-inch Blount tool grinder with water pump.
One power hack saw having swivel vise taking 14-inch blade having a capacity of 5-inch by 6-inch.
One Westmacott hardening and annealing furnace.
One positive pressure blower.
One anvil tongs.
One electric breast drill.
One pipe-threading machine.
One air compressor and pressure tank.

The tool cases contain a complete assortment of small tools, such as wrenches, hammers, drills, reamers, arbors, taps, files, measuring tools, drill and lathe chucks, etc.

Experimental Steam Laboratory.

One 12-inch by 24-inch Wetherell Corliss Engine with Alden brake.
One 8-inch by 10-inch high speed engine with Prony brake.
One Sturtevant 7-inch by 7-inch vertical automatic engine.
One Clark 6-inch by 8-inch vertical throttling engine.
One Nagle 4-inch by 6-inch vertical throttling engine.
One O. & S. 3-inch by 4-inch vertical throttling engine.
One Warren auxiliary valve boiler feed pump.
One Deane duplex steam pump.
One Snow duplex steam pump.
One Blake single steam pump.
One Blake-Knowles steam pump.
One Homestead blow-off valve.
One Ohio automatic injector.
One Penberthy injector.
One Hancock inspirator.
One model of engine from Buckeye Engine Company.
One Crosby steam engine indicator.
One Crosby reducing wheel.
One Amsler's planimeter.
Two Tabor steam engine indicators, navy pattern.
One Ashcroft M. E. P. measuring instrument.
Two K. & E. planimeters.
Two standard platform scales.
One 36-inch by 8 foot horizontal tubular boiler for experiment.
One Ashton pressure gauge test pump.
One Carpenter tester for moisture in steam.
One Carpenter coal calorimeter.
One tachometer.
One anemometer.

One Watters governor.
One Pickering governor.
One Gardner governor.
One power plant from the Ford Motor Company.
One engine from the Chalmers Automobile Company.

Experimental Electrical Laboratory.

One Fort Wayne 15 kilowatt, 6 pole, 240 volts, three-phase alternator, with 1-kilowatt exciter.
One Fort Wayne 7½ horsepower, 6 pole, 220 volts, three-phase induction motor.
One Fort Wayne 12 kilowatt, 4 pole, 125 volts, direct-current generator.
One Fort Wayne 7½ horsepower, 4 pole, 115 volts, direct-current motor.
One Fort Wayne Vermont marble panel switchboard wired for alternating current control.
One Fort Wayne panel switchboard for direct current.
One Holtzer-Cabot 1½ kilowatt rotary converter.
Four General Electric transformers, 3 kilowatt, ratio 2 to 1.
One Fort Wayne transformer, 3 kilowatt, ratio 2 to 1.
Two Fort Wayne arc lamps.
One Lundell 10 horsepower, 220 volts, direct-current motor.
One 2 horsepower, 110 volts, General Electric direct-current, V. S. motor.
One Ball induction motor, ¼ horsepower, 110 volts.
One General Electric induction motor, 3-phase, ¼ horsepower, 110 volts.
One General Electric repulsion motor, single-phase, ¼ horsepower, 110 volts.
One General Electric induction motor, single-phase, ¼ horsepower, 110 volts.
One Emerson induction motor, ¼ horsepower.
One Roller-Smith portable resistance set.
One General Electric portable wattmeter.
Bank of lamps for load resistance.

The following models cut in section: —

One 4-inch Crosby pop safety valve.
One 2-inch Crosby angle valve.
One 2-inch Crosby spring seat globe valve.
One 1¼-inch Jenkins globe valve.
One 6¾-inch Crosby improved pressure gauge.
One 3-inch Chapman gate valve with adjustable seat.
One 3-inch Chapman gate valve with Babbitt seat.
One 1-inch Chapman ammonia valve.
One Hayden & Derby double tube injector.
One Hancock globe valve.
One Hancock inspirator.
One Penberthy injector.
One Bundy steam trap.
One Anderson steam trap.
One Turbo humidifier.
Two Lunkenheimer cylinder lubricators.
One Lunkenheimer boiler safety valve.
Three Lunkenheimer globe valves.

This section has been provided with pressure gauges, thermometers, weighing tanks, revolution counters, and all neces-

sary apparatus for making running tests of steam engines, pumps and boilers.

Voltmeters, ammeters, resistance sets, rheostats, magnets, coils, model motors, switches, cut-outs, sockets, rosettes, wire, also a great variety and quantity of experimental apparatus, are on hand to make suitable tests with, and to enable each student to demonstrate for himself the principles and laws of electricity.

Power Department.

One Edward Kendall & Sons 150-horsepower boiler.
One D. M. Dillon 150-horsepower boiler.
One Eynon Korting compound injector.
One Hancock inspirator.
One Cochrane feed water heater.
One Cochrane steam separator, 5-inch vertical.
One Ideal automatic non-condensing steam engine, 150 horsepower.
Two Ashcroft steam engine indicators.
One reducing valve on heating system.
One reducing valve on hot water system.
One steam damper regulator.
The necessary gauges for indicating pressure.
One 100-kilowatt General Electric 3-wire generator.
One electric compensator.
One Uehling continuous CO_2 recorder.
One Warren duplex, outside packed boiler feed pump.
One Blake direct acting vacuum pump and receiver.
One hot-water tank.
Three 10-horsepower General Electric motors.
One ¼-horsepower General Electric motor.
One 25-horsepower Bullock motor.
One 20-horsepower Bullock motor.
One 10-horsepower Bullock motor.
One 5-horsepower Wood motor.
One 4-horsepower Wood motor.
One 7-horsepower Westinghouse motor.
One combined generator and feeder switchboard.
One automatic back-pressure valve.
Two Curtis steam traps.
Two Nason steam traps.
One automatic steam trap.
One general fire steam trap.
Two wing turbine blowers.

The general equipment also includes: —

Complete equipment of humidifiers from American Moistening Company.
Complete equipment of automatic fire sprinklers from General Fire Extinguisher Company.
Complete equipment of hangers, shafting and pulleys from Kilburn, Lincoln Machine Company.
Belting from Union Belt Company.
Complete system of mill telephones from S. H. Couch Company.

Testing Laboratory.

One Scott yarn-testing machine.
One Scott cloth-testing machine.
One Moscrop single-thread tester.
One Saco-Lowell spinning frame, 36 spindles.
One set balances.
One yarn scale.
One hygrometer.
One sling psychrometer.
One conditioning oven.
One twist tester.
One stretch tester.
One yarn reel.
One roving reel.
Complete apparatus for controlling humidity of the laboratory.

Courses and Methods of Instruction.

The school, being situated in such a cotton manufacturing center as Fall River, confines its courses to those dealing with the cotton branch of textile manufacturing and closely allied subjects. The instruction work is carried on by the heads of the different departments and their assistants, there being a head for each of the following departments: carding and spinning, designing, weaving, chemistry and dyeing, engineering, and freehand drawing. In addition, there are five assistant instructors, who, together with the heads of the departments, serve during both the day and evening sessions. Owing to the number of evening students being largely in excess of the number of day students, it is necessary to employ additional instructors for this branch of work, there having been twenty-two instructors so employed last year. They are men who hold some responsible position in the line of work they handle in the evening school session, and practically all of them have taken a course of study in the evening or day classes of the school.

The instruction is given by means of lectures and demonstrations. The value of the lecture work is increased by means of lecture sheets, especially prepared by the heads of the departments and duplicated. The student retains these sheets, and consequently accumulates, during his course, a valuable reference work. Very few textbooks are used, none whatever in the purely textile work, as it is not felt that there

are any works published on the different phases of cotton manufacturing which can be adapted to the instruction work in a school such as this. In the work in chemistry and engineering standard textbooks are adopted in many cases, although in this work lecture sheets are freely used. The demonstration work is conducted on the machinery with which the school is so well equipped. Most of the students' time during the practice periods is given up to mechanical construction of the machines, the different motions found on these machines, the best methods of setting these motions, faults in the production and their remedies; the machines are taken apart, reassembled, the required settings made and stock run through them. Numerous tests are conducted to determine the best running conditions for different counts of yarn; many new appliances are tried out on the machines, and many of the ideas of the students, worked out in the freehand drawing and designing department, are carried through the looms to test their value in the finished product.

Together with the purely textile work the student is given instruction in the related subjects of chemistry, dyeing, mechanical drawing, steam, electricity and machine shop.

Day Courses.

In the day department of the school there are four courses offered, as follows: —

	Years.
General cotton manufacturing,	3
Designing and weaving,	2
Chemistry and dyeing,	2
Engineering,	2

Evening Courses.

The evening courses are planned to meet the needs of the worker in the mill, who in the great majority of cases is seeking instruction in one subject only. For this reason the work is divided into a number of distinct courses, each course dealing with one subject, extending over, whenever possible, a period of thirteen weeks, one-half of the evening school year. In some cases, however, where it is not possible to confine the course to this period it may extend for the full evening school

year of twenty-six weeks. Each class meets two evenings a week of one and three-quarters hours each.

At the same time, the work is so arranged that a student wishing a more comprehensive course may obtain the same by continuing with the school and taking additional courses.

The instruction work in the evening classes varies largely with the courses being given. Certain of the classes are given the theory and practice in about equal proportions, one evening of the week being given to classroom work, and the other evening being given to practice work on the machines; other courses confine their work more largely to the practice on the machinery, while some courses will require the majority of the time being given to the classroom work. No hard and fast rule can be adopted in the conduct of this work, the personnel of the class and the objects to be obtained being the governing features in all cases.

The courses offered in the evening department of the school are as follows: —

Carding and Spinning Department.

Picking and carding.
Combing.
Drawing and roving frames.
Ring spinning and twisting.
Mule spinning.
Cotton sampling (Saturday afternoon).

Weaving and Warp Preparation Department.

Plain weaving (for boys).
Plain weaving (for girls).
Plain loom fixing.
Draper loom fixing.
Stafford loom fixing.
Box loom fixing.
Fancy fixing.
Jacquard fixing.
Spooling, warping and slashing.
Mechanical drawing-in.
Plain and fancy drawing-in (for women).

Designing Department.

Cloth analysis.
Dobby designing.
Jacquard designing.

Engineering Department.

Mechanical drawing.
Machine shop.
Steam boilers.
Steam engines.
Electricity.

Chemistry and Dyeing Department.

General chemistry.
Commercial analysis.
Textile fibers and bleaching.
Dyeing.

Freehand Drawing Department.

Freehand drawing and painting. | Fashion and costume illustration.

Mathematical Department.

Mill calculations.

Students.

The following gives the registration and residence of evening students: —

Fall River,	1,510	East Providence,	2
Somerset,	8	Taunton,	14
South Somerset,	2	Warren,	18
Westport,	1	Swansea,	8
Tiverton,	10	Pottersville,	3
North Tiverton,	1	Newport,	1
South Attleborough,	1		
Providence,	2	Total,	1,581

From the above registration 793 attended the evening school, no student having had his name placed upon the register until he had been in attendance at least three evenings. A number of these men took more than one course during the year, and in giving the following list of students by classes a student taking more than one subject is counted in each class for which he enrolled: —

Picking and carding,	62
Combing,	21
Drawing and roving frames,	57
Ring spinning and twisting,	43
Cotton grading,	56
Weaving,	37
Plain loom fixing,	66
Draper loom fixing,	49
Fancy fixing,	50
Spooling, warping and slashing,	19
Web drawing,	25
Designing,	34
Cloth analysis,	28
Mill calculations,	18
Chemistry,	26
Commercial analysis,	4
Dyeing,	11
Freehand drawing,	71
Mechanical drawing,	105
Machine shop,	76

Steam boilers and engines,	102
Electricity,	51
Total,	1,011

Ninety-seven students attended the day classes, as follows: —

General cotton manufacturing: —	
First year,	14
Second year,	2
Third year,	2
Chemistry and dyeing: —	
First year,	7
Second year,	3
Engineering: —	
First year,	15
Second year,	3
Special cotton manufacturing,	3
Designing and weaving,	16
Carding, spinning and twisting,	3
Loom fixing,	1
Machine shop and mechanical drawing,	13
Freehand drawing,	15
Total,	97

The following gives the residence of day students: —

Massachusetts: —		Rhode Island: —	
Fall River,	57	Woonsocket,	2
Taunton,	6	Tiverton,	1
Lakeville,	1	Adamsville,	1
Whitman,	1	Central Falls,	1
Somerset,	1	Providence,	2
Salem,	1	Cranston,	1
Lawrence,	1	Philadelphia, Pa.,	1
Williamstown,	1	Samos, Greece,	1
North Westport,	1	New York City,	1
Allston,	1	Hartford, Conn.,	1
Boston,	2	Piqua, Ohio,	1
Webster,	1	Shawmut, Ala.,	1
Lynn,	1	Montpelier, Vt.,	1
Middleborough,	1	Total,	97
Bolton,	1		
Revere,	1		
Dorchester,	2		
Fitchburg,	2		

Nine students were graduated from the day courses last May, as follows: —

General Cotton Manufacturing.

Diploma Course, Three Years.

Kenneth B. Bowers. Ambrose J. Murphy.

CHEMISTRY AND DYEING.

Certificate Course, Two Years.

William C. Allinson. Gus Barber. Stephen J. Luscian, Jr.

ENGINEERING.

Certificate Course, Two Years.

Alphonse R. Garneau.

FREEHAND DRAWING AND PAINTING.

Beatrice P. Durfee. Jessie C. Eldredge. Milton E. Sunderland.

SPECIAL ACTIVITIES OF THE SCHOOL DURING THE SCHOOL YEAR, 1919–20.

The Americanization classes which were conducted the previous year by the authorities of Fall River in a room of this school, loaned for that purpose by the trustees, were continued through the school year 1919–20. The students in these classes were drawn largely from those mill operatives who work in three shifts of eight hours each, as, for illustration, firemen, many of whom are thus enabled to attend classes during the regular school hours. It has been the contention of the local school authorities that such men are more readily induced to take up the study of the English language and other subjects when such work is given in a school similar to a textile school, than they are when the work is carried on in a strictly public school building.

A short time previous to the ending of the school year 1918–19 the Federal Board for Vocational Education, under whose auspices several students were pursuing work in this institution, approached the trustees of the school with the request that during the summer months of 1919 the school care not only for those Federal Board students who had been placed in this school, but also for those who had been placed in the two other textile schools of the State. This request was granted by the trustees. The students, who as a result of this action studied at the Bradford Durfee Textile School during the summer of 1919, were in all cases men who, as the result of war service, had been incapacitated for their previous occupations and were being trained for new work. Not only did this institution give these men instruction during those months, but

also, through the generosity of many interested citizens, it was enabled to provide a number of very pleasant outings. As many of the students had not entirely recovered from their war experiences, these outings proved very beneficial as well as enjoyable. When the regular classes opened in the fall of 1919 such men as had been transferred to this school by the Federal Board for summer work were again assigned to those schools with which they had been originally placed by the Federal Board. Throughout the school year of 1919–20 this school continued to receive men assigned to it for rehabilitation work, and during that time no inconsiderable part of the work of this school consisted of the instruction given these men. There were in all 29 students who followed some branch of the school's work under the direction of the Federal Board for Vocational Education, distributed as follows: general cotton manufacturing, 2; machine shop and mechanical drawing, 14; designing, 8; carding and spinning, 3; chemistry and dyeing, 1; loom fixing, 1.

Evening classes were also conducted in the assembly hall of the school, during a portion of the year, by the Fall River Immigrant Committee, the hall having been loaned by the trustees for this purpose. Upward of 200 attended these classes, all of whom were foreigners, the object of the work being to prepare the members of the class for the taking out of citizenship papers.

For some time the management of this school has recognized the necessity of better facilities for making scientific tests on the different materials that are manufactured by the students in their regular school work, and also on any material that may be brought to the school by outside parties. During the school year a room for such a laboratory was constructed on the top floor of the mill building and a very creditable amount of testing apparatus installed. This room was also equipped with a humidity control, which is automatic and which allows the humidity of the room to be fixed at any desired point at any time. Consequently, if tests are made in this laboratory at widely varying intervals of time the tests are scientifically comparable. This is not true when tests are made under varying conditions, as results have been found to differ very materially, due entirely to the conditions under which the tests were

made. While this laboratory is capable of expansion in the future, yet the school is at the present time able to carry on tests which will prove extremely beneficial, not only to the student body but to the textile industry as a whole.

The school has done considerable work during the past year in the way of interesting the local mills in the question of selecting worthy boys from their organizations and giving them the opportunity of taking work in the day classes of the school, and at the same time having their pay continued by the mill. The first student to be received by the school under these conditions was admitted at the beginning of the second term, and during the remainder of the school year there were in all ten such students received. The time that these men devoted to the school work varied considerably. Some of them gave only certain afternoons of the week to the school work, devoting the remainder of their time to the work in the mill; others gave all their time to the school work, but for a short period, such as ten weeks; while some gave all their time for the remainder of the school year. This work is capable of being extended very materially, as many more of the mills stand ready to give this opportunity to men in their organizations, providing they can find the right men.

SCHOOL STAFF.

HENRY W. NICHOLS, A.B.,	*Principal.*
WILLIAM E. DRAKE, B.S.,	*Assistant Principal, Head of Engineering Department.*
FRANK KERSHAW,	*Head of Chemistry and Dyeing Department.*
FREDERICK B. HAYS,	*Head of Designing Department.*
WILLIAM A. GOSS,	*Head of Carding and Spinning Department.*
ALBERT E. DEAN,	*Head of Weaving Department.*
LUCIEN SCHIMPF,	*Head of Freehand Drawing Department.*
CONSTANTINE T. SOTTERY, A.B.,	*Assistant in Chemistry and Dyeing Department.*
FRED H. HULING,	*Assistant in Mechanical Drawing Department.*
DAVID HIRST,	*Assistant in Machine Shop.*
JOHN T. HILTON,	*Assistant in Carding and Spinning Department.*
WILLIAM H. BROOMHEAD,	*Assistant in Designing Department.*
HERBERT V. MARTIN,[1]	*Head of Carding and Spinning Department.*
HAROLD E. MASON,[1]	*Assistant in Engineering Department.*

[1] Resigned Sept. 1, 1919.

Assistant Evening Instructors.

Gladstone Fish,	*Fancy Fixing.*
John W. Norman,	*Fancy Fixing.*
Alfred Burns,	*Plain Loom Fixing.*
Arthur Norman,	*Plain Loom Fixing.*
Fred Robinson,	*Plain Weaving.*
Walter Scott,	*Draper Loom Fixing.*
James Vincent,	*Draper Loom Fixing.*
Thomas Tansey,	*Spooling, Warping and Slashing.*
Minnie Remillard,	*Web Drawing.*
Daniel Harrington,	*Mechanical Web Drawing.*
William D. Britton,	*Machine Shop.*
Ernest Brightman,	*Machine Shop.*
Nicholas Kepple,	*Steam Engineering.*
James Allardice,	*Mechanical Drawing.*
John Hallas,	*Electricity.*
Stephen Luscian,	*Chemistry.*
Mathew H. Bower,	*Pickers and Cards.*
J. Frank Heflin,	*Combers and Speeders.*
George Wilkinson,	*Pickers and Cards.*
Richard Lynch,	*Ring Spinning.*
Joseph Dupuis,	*Ring Spinning.*
Samuel Fitton,	*Combers.*
William A. Ramsbottom,	*Cotton Grading and Stapling.*
D. Julien Burgess,	*Assistant Cotton Grading and Stapling.*

LEONTINE LINCOLN, *President.*
JOHN S. BRAYTON, *Vice-President.*
WILLIAM HOPEWELL, *Clerk.*

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